April 4, 1983

Dear Manufacturer: CD-83-5(LD)

Reference: CD-82-11, dated December 27, 1982

I am writing to clarify the conditions under which a vehicle must be operated at "maximum available power." A question has arisen as to how the regulations will be interpreted. I want to take this opportunity to explain our position to avoid any possible future misunderstandings.

Under EPA's test procedure regulations a light-duty vehicle or light-duty truck must be operated at maximum available power under certain conditions:

> §86.115-78 EPA Urban Dynamometer Driving Schedule.
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> (b)(l)(iv) Speeds lower than those prescribed are acceptable provided the vehicle is operated at maximum available power during such occurrences.
>
> §86.128-79 Transmissions.
>
> (e) ...If the vehicle cannot accelerate at the specified rate, the vehicle shall be operated at maximum available power until the vehicle speed reaches the value prescribed for that time in the driving schedule. (Emphasis supplied)
>
> §600.109-78 EPA Driving Cycles.
>
> (b)(2) ...Speeds lower than those prescribed are acceptable provided the vehicle is operated at maximum available power during such occurrences.

Our concern here is not with the definition of maximum available power. As discussed in my letter CD-82-11, attaining maximum available power may require downshifting or delays in upshifting. The purpose of this letter is to discuss those circumstances which require its use.

The intent of the regulations is to have vehicles follow the speed-versus-time sequence as closely as possible using the minimum amount of accelerator pedal movement. Speed tolerances are not to be used to create a new driving schedule. They exist to allow for small driver deviations and other variables which prevent exact conformance with the required schedule. When deviations occur, the driver must make an appropriate correction in order to regain the required speed in a reasonably short period of time. For vehicles with adequate power, this has not been a problem. However, some lower powered vehicles equipped with manual transmissions may have to be downshifted or may have to have upshifts delayed in order to meet the driving schedule.

In the past we normally only checked to determine that a vehicle stayed within the driver's tolerance band in validating a test. With the greater prevalence of lower power vehicles coupled with lower upshift speeds, it is necessary to more rigorously review tests to determine full compliance with the regulations. Our laboratory is now reviewing drivers traces to assure that the vehicle was operated at maximum available power if necessary to follow the speed-versus-time sequence. When a vehicle does not maintain the required acceleration rate, the Certification Division will be informed. We, in turn, will contact the manufacturer to ascertain whether or not the vehicle was at maximum available power. If the vehicle was not at maximum available power then the test will be voided and a revised shift schedule will be required. To prevent a trial and error process in our laboratory, we will review drivers traces from the manufacturers' test to verify that the acceleration rate was maintained. If it was not, the vehicle will be returned for retesting under the appropriate revised shift schedule before further testing at EPA's laboratory.

The regulations do not require absolute adherence to the driving schedule. If the driver begins an acceleration a little late, he/she must attempt to regain the required speed. If the vehicle is incapable of this, the test will still be acceptable if the accelerator pedal is fully depressed (except for gear changes) and the required acceleration rate is being maintained. (A vehicle is considered to be accelerating at the required rate if the slope of the vehicle's speed versus time trace is the same or greater than the driving schedule). How-

ever, if the vehicle at wide open throttle cannot maintain the required acceleration rate, as evidenced by a "falling away" from the required speed trace, then a lower gear must be used unless maximum available power is already being employed.

You should institute the above procedure at your laboratory. We intend to review selected drivers traces from the manufacturers to insure compliance with the regulations. I do not expect any major problems to arise because of these reviews. An examination of the 50 most recent tests at EPA's laboratory revealed only one vehicle which may not have been operated at maximum available power as required when shifted according to manufacturer's instructions. As mentioned earlier, when we suspect that a vehicle did not follow the speed-versus-time sequence because it was not operated at maximum available power, we will contact the manufacturer, determine maximum available power operation, and void the test if appropriate. To reduce the number of tests voided at EPA's laboratory and the resulting delays, it is the manufacturer's responsibility to supply an appropriate shift schedule. If this is done, we will rarely experience the situation where we must void a test and require a new shift schedule. In order to maintain uniform treatment of all vehicles, it is necessary that we strictly enforce the regulations. Your cooperation in this matter is appreciated.

Sincerely yours,

Robert E. Maxwell, Director
Certification Division
Office of Mobile Sources